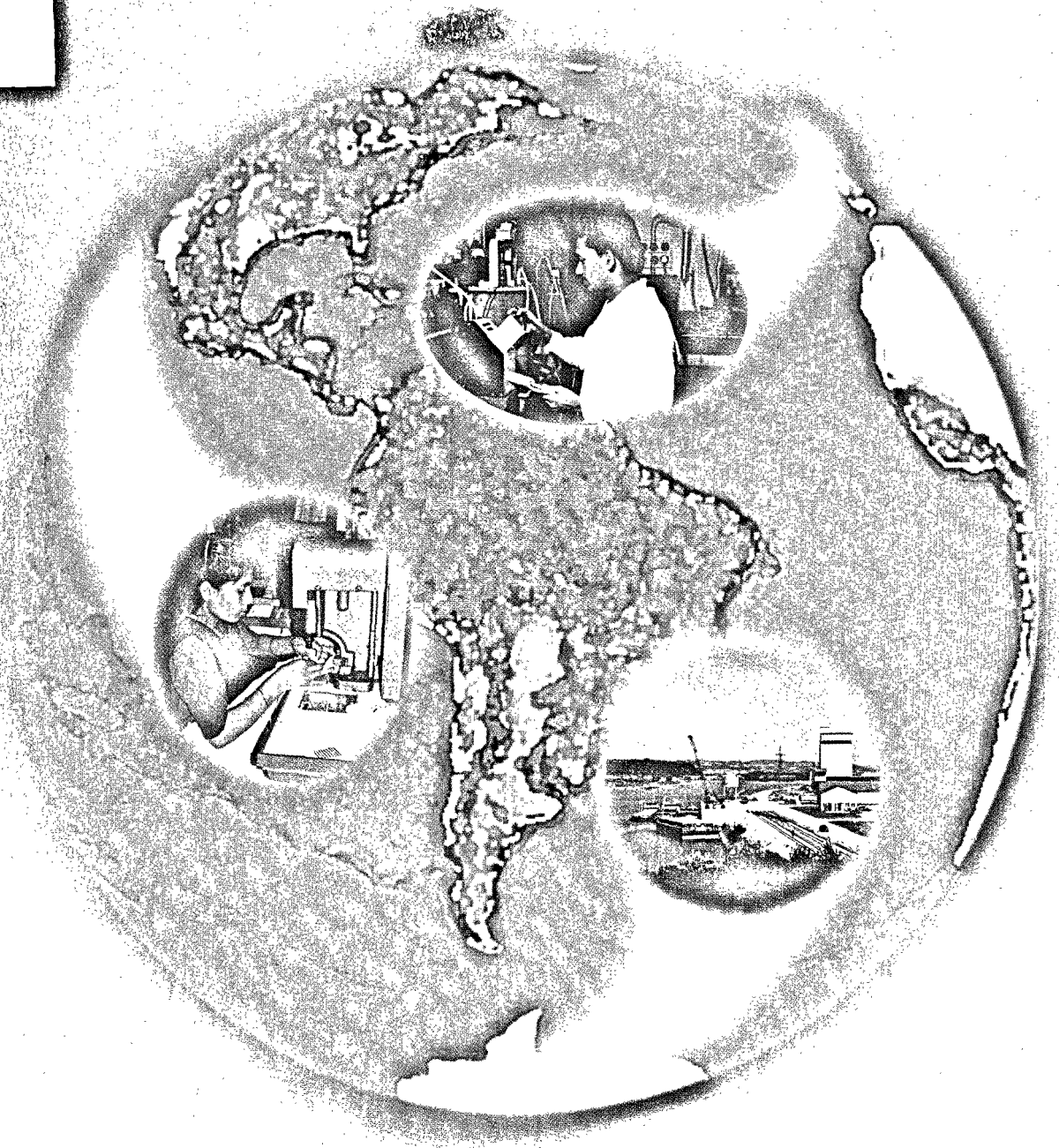


INDUSTRIAL ESTATES

Principles and Practice

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FOREWORD

Industrial estates are an important tool for stimulating industrial growth, providing cost-effective infrastructure and communal services. UNIDO published guidelines for the establishment of estates in 1978 and guidelines and specifications for the construction of small-scale industry estates in 1988. Over the past decades, the organization has also provided direct assistance to the establishment of industrial estates in many developing countries. In recent years, an increasing number of economies in transition have turned to UNIDO for advice on estates.

Developments in international manufacturing made a thorough revision of the existing guidelines necessary. Therefore, UNIDO commissioned a series of studies on industrial estates in late 1995. The present document is to a large extent based on these studies. However, parts of the text of the 1978 guidelines which were still valid (mainly information of a general nature or referring to organizational issues) were retained. As indicated by the title, the aim of the present publication is to provide decision-makers in the public and private sector with general guidelines for the establishment of estates, but key aspects of estate development are also illustrated with examples from different countries.

This publication was prepared by the Industrial Policies and Private Sector Development Branch of the Human Resource, Enterprise and Private Sector Development Branch (HEPD/IPPS).

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1. INTRODUCTION

1.1 The advantages of managed/serviced workspace

Through industrial estates, firms benefit from economies of scale in terms of land development, construction, and common facilities. Estates offer managed/serviced workspace: workshops (or plots on which to build these) with collective access to utilities, roads and telecommunications. Other common facilities which may be available include waste collection and effluent treatment; tool rooms; testing, quality control and heat treatment; and security services. Some estates have technical libraries, recreation areas and housing for workers. Such facilities are particularly effective if firms are engaged in similar activities; estates, however, usually have a mixture of industries. Close proximity may encourage cooperation among firms on an estate. Estates are not necessarily used on a permanent basis: they may also serve as an incubator or nursery, a temporary start-up facility for new firms¹⁾.

The provision of common facilities, including centralized effluent treatment, pollution prevention and energy conservation measures, can be of particular value to small and medium-scale enterprises (SMEs), which often cannot afford these on an individual basis. This is one way in which estates can make a contribution to equitable and sustainable development. For micro-enterprises, however, they tend to be less suitable. Their survival often depends on family labour and on a business network that may not extend beyond a city block. Any type of managed work space for these enterprises should therefore be located very close to their markets and the homes of the owners-entrepreneurs. The best solution may be to provide basic infrastructure (electricity, water) and advice on clean production methods in locations where clusters of such enterprises arise spontaneously, because these are evidently places where they flourish.

Well-planned and equipped estates stimulate the relocation of industries to peri-urban or rural areas, helping to relieve congestion and pollution in metropolitan areas, strengthen the industrial base of small and medium-size towns and arrest rural-urban migration. Additional benefits of a well-planned industrial estate to society are a reduction of commuter traffic, increased efficiency of urban land use, and reduced costs of land development and the provision of utilities.

Good management is vital for the success of an estate. The agency responsible for the estate should not limit itself to maintenance of the facilities and supervision of activities, but play a dynamic role, promoting the services offered by the estate among local entrepreneurs. Depending on the development objectives, an estate's services may also be marketed elsewhere in the country, and possibly abroad. If an estate is run by a public-sector agency, it is essential that staff with private sector experience is employed for this purpose.

Industrial estates may serve as a step towards more advanced industrial infrastructure such as export processing zones (EPZs) and science and technology (S&T) parks²⁾. EPZs can play a useful role in countries which intend to develop an export-oriented manufacturing sector, but do not have adequate countrywide conditions for foreign investment and imports of raw materials and equipment. Physically, an EPZ need not be restricted to an estate location. An EPZ should not remain an enclave: to be a real catalyst of export-oriented manufacturing, it must develop linkages to domestic industries. S&T parks basically provide the same kind of infrastructure as estates, but are intended for technologically advanced industries and emphasize the high-level support services that such activities need: technical consultancy through networking with local

1) Business incubators are discussed in a separate UNIDO publication: Practical guidelines for business incubators in Central and Eastern Europe. A special software, *The Incubator Financial Programme*, is available for analyzing the financial aspects of incubator establishment. This material is available from UNIDO's Small and Medium Industries Branch (HEPD/SMI).

2) Export processing zones - principles and practice, 1995. A publication on S&T parks will appear in autumn 1997.

R&D institutions; advisory services on finance and venture capital; marketing; and search for joint venture partners. EPZs are the subject of separate UNIDO publications.

1.2 The developmental context

Estates (and the more advanced types of industrial infrastructure) can only contribute to industrial development in the context of an overall development strategy. Without macro-economic policies ensuring a favourable business climate and without an adequate power and transport infrastructure, investment in an estate may be wasted. If demand projections are overambitious, facilities are likely to remain underutilized; this will lead to financial difficulties, the effect of which will be declining services and, eventually, closure. A good pre-feasibility study should therefore pay as much attention to the environment in which the estate operates as to the estate itself.

Location and scale of government-owned estates were in the past often based on political rather than economic criteria, and a dynamic, flexible response to the demand for services by enterprises was often missing. Nowadays, however, most estates are the result of private initiative, and the success rate of private estates is high in both developed and developing countries. Not all estates need to be profit-making operations, and in specific situations public investment in an estate which may only contribute to development of a backward area in the very long run can be socially justified. But basically, an estate should be considered as a normal commercial operation charging an appropriate price for a good package of services.

The issue of regional and local development has become increasingly important in recent years. The role of many governments in economic development has weakened, and with administrative decentralization the focus of public-sector efforts to stimulate development has shifted to the local level. Competition among localities has acquired a global character. Traditional rural occupations no longer provide an adequate living, migration of the young and better educated from rural areas leads to social erosion and contributes to the congestion in metropolitan areas. Estates can be a useful instrument for efforts by local authorities and business associations to tackle these issues and stimulate local development if they are part of an overall development strategy, and if local regulations and legislation which have a specific impact on estates (planning, environmental protection, landownership) are transparent and consistent.

Where large public or parastatal firms have dominated industry in the past - as in East European and many African countries - little attention has been paid to the need of SMEs for managed/serviced work space. These key actors in industrial development may thus be hamstrung for lack of adequate, affordable infrastructure. It should, however, be kept in mind that providing or improving managed work space and related support services to SMEs will not be enough: "Public support for SMEs in developing countries tends to be overly supply oriented...and not sufficiently focused on demand"³⁾. The SME sector has often been discriminated against, and has lacked influence on political decision making. Measures to improve the business climate and access to (information on) markets should therefore target the SME sector in particular. It should be encouraged to mobilize its own forces through subcontracting and other forms of enterprise networking. Improvements in SME infrastructure should, in short, form a coherent package with other policy measures.

1.3 THE ROLE OF UNIDO

The establishment and management of an industrial estate has many technical, economic and policy aspects. UNIDO, through its multidisciplinary staff and wide network of outside experts,

3) John Humphrey and Hubert Schmitz - Principles for promoting clusters & networks of SMEs, Discussion Paper no. 1, HEPD/SMI, UNIDO 1995, p. 26.

can offer an integrated approach to estate development. The organization's wide field presence ensures an awareness of local demand and enables it subsequently to design support programmes which answer specific local needs. The organization's neutral position, finally, ensures unbiased advice. In providing this service, it has worked and is working with private-sector institutions such as chambers of commerce and industry, industrial associations, and cooperatives.

UNIDO can provide assistance in the following specific areas:

- ◆ Formulating guidelines after analysis of global trends and evaluation of managed workspace programmes;
- ◆ Formulating a master plan for estates;
- ◆ Pre-feasibility studies and detailed feasibility analyses, including environmental impact assessments;
- ◆ Building the physical infrastructure (on a contract basis);
- ◆ Training of staff;
- ◆ Provision of guidance during the start-up phase;
- ◆ Diagnosis of operational problems and advice on the expansion or rehabilitation of estates;
- ◆ Facilitating the exchange of information on successful estates and parks, and on their environmental or social impact.

2. TYPES AND CHARACTER OF INDUSTRIAL ESTATES

2.1 Estates versus industrial zones and industrial areas

An industrial estate can be defined as a tract of land developed and subdivided into plots according to a comprehensive plan with provision for roads, transport and public utilities with or without built-up (advance) factories, sometimes with common facilities and sometimes without them, for the use of a group of industrialists.

Two points in the above definition need amplification. The comprehensive plan refers not only to the physical planning of the estate, but also to its immediate economic and social environment, and the role assigned to it in the regional or urban development plan. The common facilities mentioned may be needed to improve the productivity of tenant enterprises, to provide technical and non-technical services to clients, or to upgrade the social infrastructure and amenities in the area.

An industrial zone is merely an area of raw land set aside for industry. In general, it is created by a municipal by-law and is part of an urban renewal or development programme. Any promotional effect it may have is dependent on its location in relation to transport and distribution facilities, and the price of land within the zone.

An industrial area is a parcel of improved land subdivided into plots for the accommodation of industrial establishments and offered for sale or for lease. Its size may allow advantage to be taken of economies of scale in providing the infrastructure, which may be passed on to the occupants. An attraction for a prospective occupier is the time saved in finding a site and in preparing the land. The industrial area is essentially a piece of real estate promotion. An industrial area may approximate an industrial estate, but the essential differences are that in the former there is no unified and continuous management and that, beyond land and utilities, it provides no additional incentive to industry.

2.2 Types of industrial estates

An industrial estate may be classified according to the sponsorship, the location, or the function it performs. The subdivisions of the last category are not mutually exclusive. An estate may be intended to fulfil more than one function.

LOCATION

Estates often are classified as "urban", "semi-urban" or "rural". In the present context, an urban estate is defined as one located in, or within easy commuting distance of, the metropolitan area or a city of, say, 500,000 inhabitants. Semi-urban and rural refer more to the region in which the estate is situated than to its actual site. A semi-urban estate is one located in the principal town of a mixed urban and rural area. The population of the centre should not be less than 50,000. A rural estate is not one built in the open country, as the name might imply, but in the central town, the population of which should be at least 25,000, of a predominantly rural region.

The lower limits of population given above should be treated with caution. For an estate to be viable, the city or town in which it is established must be able to provide the utilities and services required by tenant enterprises. These usually are not to be found in small towns and villages.

INDUSTRIAL ACTIVITY

The classification of an estate by the function it performs, or is expected to perform, tends to be confusing since normally there is more than one function. To some extent this may be resolved by separating function into activity and motivation.

An estate may be described as:

- (a) Composite: containing establishments engaged in a variety of unrelated industries;
- (b) Ancillary: containing enterprises, usually small, in various fields, but all serving one large establishment and frequently supervised by the parent enterprise;
- (c) Single trade: often called "functional", accommodating either establishments engaged in the same trade (e.g. woodworking, repair of motor vehicles) or producing the same class of articles.

MOTIVATION

Motivation is related to objectives. From this perspective, an estate can be classified as developmental, promotional, or dispersal. In most cases these descriptions refer to composite estates.

- (a) Developmental. A developmental estate is one intended to advance, improve, or increase the level of industrial activity in the area in which it is located. This will usually be a semi-rural or rural area. If, to achieve this goal, it is necessary to stimulate entrepreneurial talent among selected artisans, a variant - a nursery estate - is established.
- (b) Promotional. In a sense, all estates are promotional, but the term has come to mean the introduction of new industries into, and the improvement of existing industries in, economically backward regions. Rural estates fall into this category.
- (c) Dispersal. These estates are intended to accommodate enterprises that on account of lack of space for expansion, or for environmental reasons, are required to move from urban areas.

SPONSORSHIP/OWNERSHIP

The sponsor is the agency initiating the estate and providing all or part of the necessary funds. There are three types of sponsorship:

- (a) Governmental: central, state or municipal;
- (b) Private: co-operative society, limited company or an association of industrialists;
- (c) Private assisted: co-operative society, limited company or an association of industrialists with assistance from the government through the grant of a long-term loan.

Government sponsorship and ownership predominated heavily in the past. Donor agency funding has also played an important role in the establishment of estates in developing countries. In recent years, privately financed estates have become very common, and much of the donor assistance has shifted to advice and the funding of various support services, which should preferably be run by industrial associations.

BOX 1: ESTATE OWNERSHIP

Unlike the early days, new industrial estates are now mainly established and run by the private sector. In Mauritius, the initial impetus for estate building came from the government, but the Industrial Buildings Incentive Act of 1986 provided strong inducements to private entrepreneurs to invest in factory buildings on estates. The establishment of private estates was encouraged as well. Private estates now account for 23 per cent of total factory space, and buildings constructed by private owners under the Act for another 28 per cent. Unemployed people are encouraged to build their own workshops on estates with unsecured loans from the Development Bank of Mauritius; the default rate has been in the range of 10–15 per cent.

In Kenya, Firestone (EA) Ltd. runs the highly successful Sameer Industrial Park near Nairobi. Unlike the country's public-sector estates, it caters mainly to foreign investors. Part of its attractiveness is explained by its conversion into an EPZ. But its carefully chosen location, high quality infrastructure and efficient common services (including security) are also mentioned as factors explaining its success. As part of its economic restructuring efforts, the Kenyan government has been selling off factory units on estates run by the parastatal Kenya Industrial Estates Ltd. Unfortunately, privatization has been accompanied by a complete loss of control over activities on the estates, leading to a serious deterioration of environmental standards.

Co-operative estates, set up by a group of entrepreneurs or by a business association, are uncommon. Apart from India, Turkey is one of the few countries with a tradition of co-operative industrial estates, going back to the 1950s. At the end of 1995 there were 722 active Small Industrial Estate Construction Co-operatives, and 133 estates providing facilities for 35,565 workshops were under construction. Co-operatives which comply with certain laws are eligible for government support in the form of credit. Estates constructed with government support mainly cater for the metal working sector (including automotive repairs). The wood products industry is also well represented. This type of estate accounts for about 45 per cent of the total; the remainder has been wholly financed by co-operative members themselves.

Some of the co-operative estates in Turkey are very large. The Istanbul-Ikitelli Small Industrial Estates Zone, now under construction, will accommodate 33 cooperatives and 33,000 workshops. The self-financed IVEDIK Small Industrial Zone in Ankara is intended for 10,000 workshops. On the completed estates, 80 per cent of the plots has been taken up.

In spite of the growing role of the private sector, a large industrial estate programme cannot be carried solely by private enterprise. Land ownership issues, planning and environmental considerations will make it essential to involve the authorities. Many of the "private-assisted" estates are the result of official pressure on industrialists to relocate their work-places to less congested or environmentally less vulnerable sites. It is the task of government to ensure that private estates contribute to broader development objectives than those which the sponsors may have in mind. A coherent strategy for industrial estate development may be desirable. To ensure that such overall development objectives are attained, it may be necessary to set up a parastatal estate development authority even though the actual attainment of the objectives is left to the private sector (see Chapter 3). In a country or region with a low development level, it may be necessary for a government to "prime the pump" by financing at least the first estates and setting up basic support services. Where estates are privatized, new owners should sign an obligation to maintain environmental standards, sewage systems, etc.

2.3 Estate accommodation

The accommodation, if any, provided by estate sponsors depends to a great extent on what they hope to achieve. There are five variations:

- (a) Custom-built factories are provided throughout, usually for a selected range of industries based on locally arising materials;
- (b) Standard and custom-built factories are erected, the latter to attract some special industries;

- (c) Standard factories of various sizes are provided throughout. This is the usual pattern adopted for estates intended to stimulate small-scale industry;
- (d) The estate provides fully developed plots and a number of standard factories. Estates intended to accommodate large- and small-scale establishments are of this type;
- (e) Only fully developed plots are provided. The lessee of a plot builds his own premises in accordance with the estate building regulations. This has the great advantage of minimizing the sponsors' investment and of allowing the development to be most accurately phased to meet the demand for accommodation.

3. POLICIES AND PROGRAMMES

3.1 Policy options

The implementation of an industrial estate programme will in many cases involve a substantial investment of public funds. Even a privately-sponsored estate will require connections to transport infrastructure and public utilities. In view of other government commitments, it should be considered whether that scarce resource could not be used more advantageously to meet some other need. For a decision to be made, it is necessary to know which contribution an industrial estate programme is likely to make towards the realization of the national objectives in the fields of industrial, regional and urban development, and whether they could be attained by other means. It may be easier or more cost effective to stimulate entrepreneurs through industrial pioneer status schemes, and foreign investment through the remission of corporation tax and various duties. An estate may also have negative consequences: loss of agricultural land, income from fisheries lost due to the construction of an estate-cum-port. These have to be weighed against expected economic and employment gains.

For areas which do not suffer from congestion but which have a sufficient "critical mass" of industrial activities and an adequate infrastructure, a regional development agency may be the right solution. Often, the services provided by both estates and development agencies may be needed. The latter will have a much broader mandate, and estate sponsors and operators should use the development strategy followed by the agency as a basic guideline for their own operations. It might be possible for them to join the supervisory board of such an agency and to participate actively in the debate on local or regional development issues. This will help them to provide a more effective service and to plan for future estate activities.

The potential contributions of an industrial estate programme, adequately supported and co-ordinated with other development programmes, are listed in Boxes 2 and 3. Not all of the contributions are equally important. Some, in fact, are the consequences of others. Normally the greatest weight will be placed on increased national and local employment, the attraction of private local and foreign industrial investment, the promotion of small-scale enterprises, the achievement of more balanced regional distribution of employment and production, or the orderly location of industry within the metropolitan area. One of the above goals is likely to be the primary objective of the estate programme, but that does not preclude the pursuance of several secondary objectives.

3.2 Determinants of the industrial estate programme

What are the conditions that make an industrial estate necessary? These must be determined not only from the urban or regional standpoints, but also, in each case, from the social and economic aspects, now and in the foreseeable future. The following questions bear on the decision to embark on an industrial estate programme; they are broken down by urban, semi-urban and rural-regional considerations:

URBAN

- (1) Is the urban population growing at a faster rate than the national average?
- (2) Is the level of unemployment rising in the area?
- (3) Are the schools, hospitals and housing inadequate to meet the current demand or that of, say, three years hence?

BOX 2: CONTRIBUTIONS OF ESTATES TO ECONOMIC AND INDUSTRIAL DEVELOPMENT

Industrial estates serve:

- (a) To promote more rapid industrialization of the country;
- (b) To increase national and local employment;
- (c) To achieve a more balanced regional distribution of employment and production, and consequently more balanced regional growth;
- (d) To attract private investment, both national and foreign;
- (e) To promote the development of small domestically owned industries;
- (f) To bring industries and industrial employment to rural areas;
- (g) To induce structural changes in production and employment, especially diversification;
- (h) To encourage more effective use of resources through the development of large-scale industrial complexes, including diversified industries of all sizes, centred on major projects such as ports, airports, railroad and highway junctions, power plants, oil refineries, steel mills and chemical plants;
- (i) To improve product quality and increase productivity;
- (j) To train labour and increase its productivity;
- (k) To achieve economies in investment in public infrastructure;
- (l) To reduce the cost of capital investment to the industrialist;
- (m) To eliminate delays for the industrialist in obtaining a suitable site, utilities and buildings.

BOX 3: CONTRIBUTIONS OF ESTATES TO URBAN AND REGIONAL DEVELOPMENT

As part of urban and regional planning, industrial estates serve:

- (a) To promote decentralization by preventing or checking excessive concentration in or growth of single urban areas, especially large metropolitan areas;
- (b) To increase the economic, productive and employment base of urban communities;
- (c) To regulate the inflow of industry and to guide its orderly location on the most suitable land within the metropolitan area;
- (d) To strengthen the economic base of small and medium-sized towns;
- (e) To provide a healthier and more attractive urban environment by separating non-industrial and industrial areas;
- (f) To minimize distance to work and to reduce load on the transport system;
- (g) To maximize efficient land usage and reduce the cost of land and land development;
- (h) To integrate urban marginal population into the productive industrial system;
- (i) To provide sites to relocate industries displaced by urban renewal projects;
- (j) To achieve economies in the provision of urban services and utilities.

- (4) Is there an unduly high percentage of the local labour force engaged in marginal economic activities, such as domestic service, street vending, petty trading?
- (5) Are the industrial establishments scattered through the residential and/or commercial districts?
- (6) Is there any plan to redevelop the areas occupied by industry?
- (7) Do the present locations of industry, or the activities of industry, create any dislocation of traffic or other nuisance?
- (8) Are industrialists finding it difficult to secure space for expansion?
- (9) Is competition for industrial premises causing rents to be increased when leases are renewed?
- (10) Is the demand for water or electricity now, or in the near future, likely to exceed the supply?
- (11) Are industrialists diverted to other centres on account of lack of accommodation or services?
- (12) Could the productivity of small-scale enterprises be improved by common facilities?
- (13) Do small entrepreneurs occupy rented premises?
- (14) Would a substantial number of entrepreneurs be prepared to move if suitable accommodation were provided elsewhere and a guarantee were given that vacated premises would not be occupied by competition?
- (15) Do the majority of workers reside some distance from their places of employment?
- (16) Is the public transport system overloaded?

An affirmative answer to all or most of these questions would indicate that there were grounds for initiating an industrial estate programme. Such a programme probably would involve the building of an estate for large- and medium-scale establishments in a satellite town, or one for small-scale industry on the periphery of the metropolitan area.

SEMI-URBAN

- (1) Is there migration from the semi-urban area to the metropolis?
- (2) Is the level of unemployment rising in the area?
- (3) Is the industrial base static or contracting?
- (4) Does any one industry predominate in the area?
- (5) Do the local industries make substantial use of local raw materials?
- (6) Could new industries be introduced to make greater use of local materials?
- (7) Are the majority of industrial establishments in the area grouped in the principal centre of population?
- (8) Is the area market sufficiently large to support the manufacture of consumer goods?

Affirmative answers to questions (1), (2), (3), (6), and (8) would indicate, depending on the scale of the activities, that an industrial estate could be the solution to the problem of the area. If there is a dominant industry, the possibility of establishing a single trade estate should be considered.

RURAL REGION

- (1) Is there extensive unemployment or underemployment in the region?
- (2) Is there substantial migration from the region to semi-urban areas or urban centres?
- (3) Is there any significant industrial activity, other than handicrafts, in the region?
- (4) Is the industrial activity concentrated at one or two locations?
- (5) Is there a dominant industry other than agriculture?
- (6) Are there local materials that could be processed at some central point in the region?
- (7) Which are the markets that support the manufacture of unsophisticated consumer goods?
- (8) Are the utilities and transport facilities adequate?
- (9) Can utilities and transport facilities be upgraded at reasonable cost?
- (10) Is there a supply of skilled workers in the region?

Affirmative answers to all of the above would establish that there is a need to improve the employment opportunities in the region, and that there is a *prima facie* case for an industrial estate. If the answer to (3) is negative, the options open are:

- (a) A nursery estate to stimulate artisan entrepreneurship;
- (b) An estate for selected industries that can be attracted to the region to process local materials.

The first would require the provision of a suitable range of common production facilities. Possible activities might be the repair of motor vehicles and agricultural machinery and the making of simple agricultural implements, cooking utensils, furniture and crates for agricultural produce. In many rural districts weaving is carried on as a cottage industry. The production of hand-woven cloth can be substantially increased by the provision of facilities for winding the warp on the back beam of the loom, and for finishing the fabrics. Such facilities could be built into a nursery estate.

The possibilities of attracting industries to process local materials depends on one or more of the following conditions:

- (a) The existence of an untapped source of raw materials;
- (b) The process to be carried out results in a weight loss, with consequent reduction in transport charges;
- (c) There is a market for the output. If there is a large industrial establishment in the region, the possibility of small-scale firms serving as subcontractors should be explored.

The lack of skilled workers does not necessarily rule out the establishment of an estate. Rural labour can be trained, which would mean that a training programme must precede the development of the estate.

3.3 Incentives

Almost every country offers incentives to entrepreneurs to establish new undertakings. In general, these are available either to the whole or to a particular section of industry. Frequently, additional inducements are available to attract firms to industrial estates. Often, the latter are made in connection with the government policy on the decentralization of industry.

The additional or special inducements may be one or more of the following:

- ◆ Long- and short-term credit at preferential rates
- ◆ Remission of taxes and duties
- ◆ Advance factories, subsidized rents
- ◆ Low-cost land/low plot rents
- ◆ Subsidized tariffs for water and electricity
- ◆ Preferential rates for telecommunications services
- ◆ Simplification of procedures/one-window service for administrative issues
- ◆ Use of common production facilities and services
- ◆ Workers' housing/industrial townships

This is a list (not necessarily complete) of incentives used today, in developing countries. Grants, which used to be common, are rarely provided nowadays, and if so, they usually constitute only a small part of total capital requirements. Enterprises must be creditworthy. Government supply schemes for inputs, usually targeting small-scale industries, are still found here and there, but are generally regarded inefficient and corruption-prone (collective purchasing schemes initiated by the enterprises *themselves* can be a good alternative). Whether incentives over and above those available to industry as a whole, or to some sector of industry, should be offered to entrepreneurs to induce them to become occupants of an industrial estate is open to argument. Are such incentives necessary at all?

Some of the foregoing incentives such as low-cost land and simplified procedures may be regarded more as consequences of an industrial estate rather than anything specially offered to attract industrialists. The incentives that are available to relocated enterprises or to new establishments in specified areas are in the nature of compensation either for disturbance or for extra costs incurred through establishment in such areas. There may be justification for subsidized rents for an initial period, but within three years at most, rents should be approximately the same as the prevailing rates in the neighbourhood of the estate. Generally speaking, special incentives distort competition and should be avoided, unless they are provided with a clear objective in mind which is to be reached in a short period after which the enterprises can stand on their own legs.

3.4 The industrial estate authority

When a country launches a programme of estate development, it is advisable to set up a body responsible for the programme. The main tasks of the industrial estate authority would be to evaluate the demand for and supply of estates and to encourage private developers to undertake the construction and management of estates.

The authority can be a branch of the Ministry or Department of Industry. Usually, however, it is a parastatal. The effectiveness of a parastatal as an executing agency depends to a great extent on the degree of autonomy permitted, varying from full to merely nominal. A fully autonomous government corporation has the advantage that it can engage the specialist staff it requires, pay them at commercial rates and, if necessary, dispense with their services when these are no longer needed. The investment of public funds can be reduced by borrowing from commercial and development banks.

A parastatal authority should have a Board whose members have a wide range of administrative, business and technical skills; in other words, the private sector should be represented on the Board alongside government officials. The tasks of the Board are:

- (a) To guide and monitor the activities of the authority;
- (b) To advise the government on all aspects of estate development;
- (c) To coordinate estate development with other relevant economic development activities, spatial planning and environmental protection.

4. THE PREPARATORY PHASE⁴⁾

4.1 Pre-project survey

Before a proposal to establish an estate can be submitted for financing, a pre-project survey must be conducted which provides detailed answers to the questions listed in the previous chapter, and many more. The main elements of the survey are related to what it is hoped that the establishment of the estate will achieve; they concern the determination of the optimum combination of location, size and type of industrial estate and selection of industries.

LOCATION

The area, whether urban, semi-urban or rural, will already be determined by the objectives of the national policies on industrial, regional and urban development. The aim of the survey is to select the best location within the framework of these policies. This involves an analysis of:

- (1) Population and availability of labour
- (2) Number and nature of enterprises
- (3) Level of entrepreneurship
- (4) Local resources
- (5) Markets
- (6) Utilities and transport
- (7) Telecommunications, banking and postal services
- (8) Social infrastructure
- (9) Site and environmental issues

Population. An industrial estate cannot be successfully established unless it is in, or close to, a centre of population. Tentative figures for the minimum population of urban, semi-urban and rural centres were given in Chapter 1.

Number and nature of enterprises. An industrial estate is intended to cater to existing as well as to new enterprises. It is necessary to know with respect to existing establishments:

- (a) The number in each broad industrial group (e.g. woodworking, metalworking, food-processing, textiles);
- (b) The sources of raw and intermediate materials;
- (c) Market for output;

⁴⁾ In this phase, UNIDO's COMFAR III Expert software, which permits the user to simulate the short and long-term financial aspects of industrial and non-industrial investment projects, can be very useful. For more information contact UNIDO's Investment Services (ITPD/IS), Chief, Research and Software Unit.

BOX 4: LOCATION AND ESTATE PERFORMANCE

An estate can only contribute to decongestion and decentralized development if it is established in the right location. In Nepal, the Balaju estate is located near the intersection of the Kathmandu ring road and the Kathmandu-Trishuli highway, just outside Kathmandu and a few kilometres from the only international airport in the country. Kathmandu, moreover, is a major industrial and services centre and the densely populated valley around the capital city constitutes a major market for consumer goods. In spite of modest user charges, the estate is operating at a profit. By encouraging the location of medium and large-scale industries well away from the historical city centre, it has also contributed to the preservation of Nepal's cultural heritage, which again is an essential factor in tourism, a major foreign exchange earner. (Unfortunately, the estate has not had an all-round positive impact on its environment – see Box 7).

The estate at Birendranagar in the mid-western region of the same country is considered one of the least successful in the country. The industrial potential of this area is limited. The remoteness of Birendranagar, moreover, complicates access to markets and adequate support services. Nepalgunj, the nearest major urban centre, is 100 km away. As a consequence, only a handful of textile firms are operating on the estate. It has been suggested that a generous support package might help to balance the estate's accounts, but as the losses appear to be structural, the wisdom of this suggestion must be doubted.

The experience with small rural estates has been mixed. In India, which probably has the largest rural estate programme in the world, the percentage of functioning units on rural estates varied between 22 per cent in Bihar to 60 per cent in Karnataka, in 1995. The percentages for urban estates in Bihar and Karnataka were 35 and 81, respectively. While the way in which estates in both states are organized, linked to support services and markets would explain part of the difference, the higher success rates for urban estates would point to a need to locate rural estates near the major population centres, where industrial potential is highest.

In contrast to estates on the margins of major urban areas, the performance of small industry estates in the more remote areas of Turkey has tended to be disappointing. In Kenya, Rural Industrial Development Centres and Industrial Promotion Areas provide hard infrastructure as well as support services (including loan facilities), complementing the government's efforts for the more sophisticated urban industries. Several hundred workshops have been made available through this programme, but because of the large number of staff needed to provide support services in remote locations, overheads have been quite high.

(d) The type of premises occupied;

(e) The most common size, in terms of the number of workers, in each industrial group.

It will also be necessary to assess the prospects for expansion in individual enterprises and trade groups.

If the number of establishments is small and the employment they provide is low, an investigation should be made to ascertain the constraints on industrial growth. The establishment of an industrial estate might remove them, e.g. by providing better work-places at affordable prices and common services. If the impediments to growth cannot be removed by an industrial estate or the services usually associated with it, the justification for an estate must depend on new industries. Hence, a low weighting should be assigned to any location where the viability of an estate would depend on attracting new enterprises.

Level of entrepreneurship. A sufficient number of dynamic entrepreneurs is essential. This is unlikely to be a problem if the main purpose of the estate is to relocate existing establishments. A dearth of entrepreneurs is most likely in a rural centre. It is not an easy matter to assess entrepreneurship. An indication can be obtained from the level and diversity of industrial activity in the area; diversity is probably the better indicator, a high degree of diversity in production being associated with a greater quantum (though not necessarily higher quality) of entrepreneurship.

Availability of labour. The number of unemployed in the area is an indicator of the labour available. Not all, however, may be accustomed to employment in industry. The local labour office or the municipality should be able to provide information on the labour situation. Most industrial enterprises, except those concerned with certain types of agricultural processing, need a workforce on a year-round basis, irrespective of seasonal variations in demand for their products.

The availability of skilled workers and the nature of their skills is important. If there is a technical school in the area, the subjects taught and the output of trainees will provide useful data. The need for a sufficient number of skilled labour applies not only to manual, but also to commercial skills such as bookkeeping, typing and storekeeping. A location without a cadre of skilled workers normally should not be regarded as suitable for an industrial estate. If it meets other criteria, setting up a training programme prior to the establishment of the estate should be contemplated.

Local resources. Expanding existing and introducing new industry in a semi-urban or rural area will depend largely on making greater use of the natural resources of the area, either by the further development of those currently exploited, by the exploitation of new resources, or by more advanced technology. An industrial estate cannot be expected to initiate the first two of these; there must be contingent development plans. It is, however, a suitable venue for the introduction of improved technical procedures such as the further processing of agricultural crops.

Markets. Many enterprises (though usually not the smaller ones) nowadays operate in global markets. For small-scale enterprises the size of the local or regional market is often vitally important. To some extent this depends on the per capita income and population, but a seriously skewed distribution may limit the size of the local market, as the small-scale sector mainly serves the lower income brackets. An estimate of the market also requires investigating competing goods. In the case of competing locations, the one best able to serve the markets of the region and/or international markets should be chosen.

Utilities and transport. A well-developed highway system is essential, especially if large- and medium-scale establishments are to be accommodated. For certain industries, the proximity of an airport or a harbour for sea-going ships may be essential. Otherwise the transport costs involved may render their products uncompetitive in the external market. If there are plans to develop the transport network, these should be taken into account, particularly in relation to their timing and that of the estate. Utilities - water, electric power, sewage disposal - must be adequate for the existing and new enterprises to be accommodated on the estate. The water supply must be adequate to cover domestic, fire-fighting and industrial needs. If this amount is not obtainable from the town supply, the possibility of drilling artesian wells should be investigated. Large consumers of water, such as paper-making, wool-scouring or leather-tanning establishments, may need to be excluded if sufficient supplies are not available.

Telecommunications, banking and postal services. An entrepreneur may not be greatly inconvenienced by having to travel a few kilometres to his bank or to pick up his mail, but he must be able to make and receive telephone calls at any time during working hours. Direct international dialling should be available for firms operating in world markets.

Social infrastructure. Hospitals, schools, housing, public transport and even recreational facilities can be placed under increased pressure by the establishment of an industrial estate. It will be necessary to consult the local authority to discover how far these services and housing can accommodate any additional load, and, if not, what development plans could be proposed to solve the problem. A locality that has the capacity to provide these social overheads obviously has much in its favour.

BOX 5: EXTERNAL INFRASTRUCTURE

Haryana State, India, has a number of successful estates. Good road and rail connections and the proximity of New Delhi's international airport are major explanatory factors in their success. Some of the newer estates have residential areas with a full range of services. This has helped to attract the more advanced type of industry with a high proportion of highly-qualified staff, as it is difficult to find reasonably-priced good quality housing in the New Delhi metropolitan area.

The inadequacy of such infrastructure in Cambodia, on the other hand, is a major obstacle to the establishment of estates. Electricity and water could, if necessary, be supplied by generators and wells on site, although this would hardly be the most cost-effective method. The poor condition of the road and railway network, however, makes it very difficult to supply industries and to serve domestic and foreign markets. The country does have an extensive network of navigable waterways, which would to an extent compensate for the poor road/rail connections. There is, however, only one port for seagoing vessels: Sihanoukville. While much progress has been made with telecommunications networks and with air connections from the capital Pnom Penh, large-scale international assistance will continue to be needed for further improvements in the transport infrastructure if the country's planned estates programme is to be a success.

With rising development levels, the demand for telecommunications services increases. When the industrial estates at Blantyre and Lilongwe in Malawi were planned, telecommunications were not provided, although the sites were otherwise well connected to external infrastructure. The absence of telephones was one of a number of shortcomings which discouraged firms from taking up plots at the estates.

The Government of Mauritius, which has developed a strategy to move to higher value-added export activities such as typesetting, data-processing and software development, has made the establishment of a sophisticated telecommunications network a cornerstone of this strategy. Since 1994, Mauritius Telecom provides, among others, a videoconference service, an Integrated Services Digital Network and a data node at the La Tour Koenig informatics park, a joint venture of the parastatal Mauritius Export Development and Investment Authority (MEDIA) and the privately-owned Development Bank of Mauritius. The park is not yet commercially viable, which may be due to its recent establishment. MEDIA, which as an estate agency has always played a pro-active role, is undertaking an aggressive promotion campaign overseas.

Site and environmental issues. Outside any consideration of the size of the projected estate, the site must be chosen in conformity with the plan for land usage of the local authority, and it must possess appropriate topographical features (see Chapter 5).

An environmental impact assessment should be part of the pre-project survey. The types of industry to be expected and their likely environmental impact should be identified. Concentrating factories on an estate provides a good opportunity to tackle their environmental impact in a cost-effective way, through collective effluent treatment and waste disposal systems, by a common approach to air pollution prevention and energy conservation. Estates for related industries may present a potential for raw material savings. The pre-investment study, however, should not only look at the immediate environmental impact of the factories alone: the location of the estate, the impact of construction activities, the type and amount of traffic an estate generates must also be taken into account.

Sometimes, redeveloped downtown areas may be suitable for enterprise location. These are only suitable for industries with a minimal environmental impact and modest transport requirements. Industrial estates are usually located on marginal land with a low agricultural value, but the area selected may be a habitat of plants or animals which are important for local ecosystems. The natural drainage pattern will be affected, groundwater reserves may become contaminated. The construction and use of port areas may destroy important marine habitats and reduce fish catches. If a residential area is to be constructed as part of the estate project, its location should ensure that inhabitants cannot be affected by any industrial accidents or pollution (including excessive light at night and noise). The environmental impact of the residential area itself should

be studied as well. Box 7 gives an impression of the factors that should be taken into account to minimize the environmental impact of an estate.

4.2 Selecting the estate type

The choice of estate type will depend on the level and composition of industry in the neighbourhood and, perhaps, on the type of materials available. The pre-project survey should reveal the type of industries that the estate may accommodate. In the long term it can be beneficial to accept only enterprises that are complementary to one another, creating linkages on the estates. This may mean that the estate will be only partially occupied for a considerable period; on the other hand, a cooperative estate could conceivably be established precisely for this purpose, by a group of industries which stand to benefit from intensive interaction.

NURSERY ESTATE

A nursery estate would be indicated if artisan activity were the only feature of the industrial scene. It could provide the physical facilities to transform artisans into small-scale industrialists. Support in the forms of common production facilities and advice, technical and managerial, would be essential.

A nursery estate (artisan work-sheds) usually consists of one or more sheds, built on developed land, so constructed that each may be subdivided to meet the varied need for floor space, and to accommodate limited expansion of individual enterprises. It is customary to provide electric power connections to each module, and for water supply and sanitary arrangements to be communal. Common production facilities may be provided. They appear to be useful only where most of the artisans are engaged in the same trade.

Normally, an entrepreneur is permitted to occupy only a specified number of modules, frequently not more than three. If his business expands to the extent that more space is required he is expected to find other accommodation. This rule works only if alternative accommodation is available. Very few tenants leave on this account. Those requiring of extra space sometimes hire it outside while still retaining their estate premises.

FUNCTIONAL ESTATE

A functional estate may be considered if there is a sufficient number of establishments engaged in the manufacture of the same or allied products. It would be a probable choice for a (semi-rural or rural) area either where local materials are worked extensively or where special skills have developed. The making of pottery, furniture, clocks and sports equipment is often found on estates of this kind. The estate may contain either standard or custom-built work-places. The size of the former may be determined by the number of workers per unit in the existing establishments.

Common production facilities, bulk purchasing and quality control arrangements can be more effective on this type of estate than on any other. Experience shows that these services should preferably be managed by the entrepreneurs as a group.

ANCILLARY ESTATE

An ancillary estate might be a feasible proposition in the vicinity of a large establishment, provided a considerable proportion of its intermediate inputs could be produced by small-scale

enterprises. Such an estate can be established only if the management of the large firm is prepared to give full support. There are a number of examples of such estates in India. There is a danger that the industrial development of the area may become too dependent on the success of the parent company; if it fails, so do all the small establishments associated with it.

The needs of the parent establishment which an ancillary estate is intended to serve will determine its composition and size. Because an estate of this kind will bring work to the area that hitherto had gone elsewhere, it may be expedient to waive the lower limit of size. Indeed, the estate will be able to take advantage of the infrastructure created by the parent enterprise.

COMPOSITE OR GENERAL PURPOSE ESTATE

Most frequently the circumstances will call for setting up a composite estate to accommodate a variety of industries. Such an estate may be designed to cater to the needs of small establishments or for mixed sizes of light industry. The requirements of heavy industry cannot economically be provided by an industrial estate. There are financial and technical advantages to estates accommodating a mixture of small and medium-sized or large enterprises. This type of estate is by far the most common. It can be designed to accommodate virtually all sizes and types of enterprise, with the exception of those engaged in heavy industry.

PROPERTY ISSUES

An estate may provide advance standard and custom-built work-places or only serviced plots. Some estates make all three available. There is a trend away from the erection of work-places in advance of demand; such construction was at one time considered to be the main function of an industrial estate. Current opinion favours the provision of serviced plots and long-term loans to enable industrialists to build their own premises. This arrangement has much to recommend it in the case of the medium-scale and upper range of the small-scale sectors. It reduces the sponsors' original investment in the estate because the loan funds are likely to come from another source. But the arrangement may not be appropriate for nursery and rural estates, for the first estate in a semi-urban region, or any estate that is required to have a demonstration effect. A good arrangement for a first estate is a combination of advance standard work-places and serviced plots on which work-sheds may be erected by the industrialists or the estate administration, if the need for them is seen.

Accommodation can be leased or sold. From the point of view of the sponsors of the estate, the main advantage of selling is that it allows them to recover their investment more rapidly. This means, however, that they will not benefit from increases in property values by progressively increasing rents. To the entrepreneur a leased work-place releases capital that otherwise would be immobilized. The advantage to him of an owned work-place is its value as collateral for any loan he may wish to raise. Probably the best method is to provide work-places on lease or for sale. An option to acquire the premises, by hire-purchase or other arrangement, can be written into the lease.

In most countries, irrespective of the ownership of the premises, the plot is leased, and the title to the land on which the estate is built remains with the government or the local authority.

4.3 Common production facilities

Common production facilities may be considered as falling into two categories:

- (a) Separate units to provide special services to estate tenants;
- (b) Equipment provided for use by estate tenants.

The reasons for providing these facilities are:

- (a) To improve the quantity, or reduce the cost, of the production of a group of entrepreneurs by making available equipment that would be too expensive for the resources of, and be underutilized by, any one of them;
- (b) To conserve the capital of the small-scale industrialist.

The *first category* might include a foundry, tool-and-die, electroplating, machine or woodworking shop, or a quality-control laboratory. They should be available if the facilities they can provide are required in economic quantities and are not available from commercial undertakings in or near the estate. Often, the number of estate tenants is not sufficient for the service to be economical, and therefore they usually undertake work for outside customers as well. Common facilities may also be used to train or to upgrade the skill of workers. In such a case a loss on the operations may be acceptable, but it should not be charged to the estate administration.

As with other services, common facilities should not be provided in advance of accurate information on the tenants' needs.

The *second category* consists of machines and machine tools to enable the entrepreneur to improve the quality and quantity of his output, or to eliminate operations previously carried out by hand. They should not be tools or machines that are a basic prerequisite to the industrial activity in question. The tools may be fixed or portable. For example, every joinery shop, except perhaps one at handicraft level, has an overhand planer, but very few of the small-scale units have the equipment to sharpen the cutters. Blunt tools result in lower production and unsatisfactory work, but a cutter grinder is expensive, and only in a large establishment could it be used to full capacity. Arrangements sometimes are made for tenants to hire portable tools - electric drills, compressors, pneumatic tools, lifting gear and the like - from the estate administration. Small-scale entrepreneurs find this facility particularly valuable.

4.4 Common service facilities

Common service facilities and the amenities found on industrial estates are listed below. Some are essential and are present on all estates; others may be desirable; and some are necessary only in special circumstances. Sometimes training and technical and managerial advisory services are included under this heading, but these are usually available to all enterprises in a branch or sector under a national industrial development programme. Their connection with an estate tends to be incidental.

Fire protection is essential. It is usual for fire hydrants to be fitted at strategic points in the water reticulation and for fire hoses to be available. The tenants are expected to provide first-aid fire appliances for their own premises (a customary requirement under all fire insurance schemes).

Security may be provided either by the estate administration, in which case it consists of fencing the area and employing watchmen, or by the establishment of a policy post on the estate. It is not uncommon, especially on estates for medium- and large-scale establishments, for the tenants to be required to fence their plots and to provide their own security guards.

Collection and disposal of estate waste must be undertaken either by the local authority or the estate administration. If the estate is within the collection area of the local authority, it should be handled by the authority. In not a few instances a local authority, while levying rates on estate premises, has declined to provide the service. An agreement should be reached on this matter before the estate is built. If the duty devolves on the estate administration, the tenants are charged for the service. Sometimes an incinerator is provided for the use of tenants.

BOX 6: COMMON FACILITIES

In developing countries, where access to support services is often a problem for industrial enterprises, estates can help to solve this problem. The Balaju estate near Kathmandu in Nepal, for example, offers the following common facilities: a clinic, a branch office of the Nepal Bank Ltd., a post office, a display centre, a day care centre for small children, a sports hall and a security service. A number of Indian estates have their own power plants, so that factories are not dependent on the often unreliable public power supply.

Common facilities for small industries are widespread in India. These facilities, established and managed by parastatals, include tool rooms, training centres and regional testing centres. A large number of estates, moreover, have been designed specifically for small industries. While there is general agreement on the usefulness of these facilities, the estates have not always been properly planned or provided with adequate utilities. As a consequence, many estates have remained half empty while elsewhere there is overcrowding. Tool rooms and similar facilities, managed by the public sector, rarely provide efficient services (the same problem is encountered in Kenya). A greater involvement of the local small business community in the design, establishment and management of estates and common technical services would probably go a long way towards solving such problems.

Human resource development for small enterprises is sometimes linked to the provision of basic industrial infrastructure. A UNIDO business incubator project in Pakistan will provide a site with offices and workshops for newly established small enterprises along with a common space for shared support services. The project runs a mentoring service which, among others, will help the new entrepreneurs to acquire training in management techniques. It also intends to stimulate the "internal dynamics" at the incubators: exchanges of experience and joint learning are considered critical to the success of the project. A UNIDO project has helped to rehabilitate the Parque Industrial Cono Sur in Villa El Salvador, Peru, establishing common services and encouraging self-organization of more than 800 small enterprises located at the estate, and providing branch-specific know-how to groups of entrepreneurs on product standardization, cost control, product quality and process improvements.

Many countries provide or have provided financial support to new firms, but financial schemes specifically targeting new factories on industrial estates are less common. The lending operations of the parastatal Kenya Industrial Estates Ltd. (KIE) averaged about 80 million Kshs yearly in the early 1990s. Interest was slightly below commercial rates; the actual difference in cost to the borrower was fairly small, but it made KIE loans psychologically more attractive – especially for small enterprises which found it difficult to get normal bank loans. The lending operations, based on a good project appraisal system, have been an important start-up help for many enterprises, but debt management is considered rather erratic. Technical supervision of new projects has also clashed with loan supervision: enterprises which are in arrears have tended to avoid contact with KIE's technical advisors. A separation of the agency's technical support and financial operations, and closer cooperation with the private sector in the financial sphere, have been suggested.

The provision of *medical care* – first-aid post, clinic or dispensary – by the estate administration depends on the current labour legislation. In some countries each work-place is required to have on the premises first-aid materials, appliances and trained personnel on a scale that would vary with the number of persons employed. Where this is not a legal obligation, it is not uncommon for the estate administration to provide the service – often a clinic with a resident dresser and a visiting doctor. For a very small estate, probably all that is needed is a small stock of first-aid materials and an estate worker with some training in the application of first-aid.

Warehouses may be necessary on estates in countries where imported inputs are allocated in bulk to groups of tenants, and the estate administration undertakes their distribution.

A *bank* and a *post office* are for the convenience of the estate tenants. They are desirable but not essential. Many estates have neither. It is not necessary for the estate administration to provide one or the other. If business develops to the extent that either a commercial bank or the postal authority sees the need to open a branch office on the estate, it will do so. It would be advisable none the less to reserve space for such an office.

A *weighbridge* may be necessary, but only in special circumstances, e.g. where there are several large firms on the estate with bulky material inputs and outputs. It is unlikely to be needed on an estate for small-scale enterprises.

A *showroom* or *exhibition hall* are luxuries. One or the other could be justified on an estate producing articles for the tourist trade, assuming that the location of the estate attracts tourists.

A *central repair workshop* to deal with machinery and vehicles owned by estate tenants is necessary. It should be provided by estate administration only if there is no commercial firm capable of undertaking the work, and then only if there is sufficient volume to justify the equipping and staffing of a workshop.

In countries where the allocation of certain materials is controlled, the estate administration may be called upon to *endorse applications for materials* submitted by tenant enterprises. It is a necessary service and one that does not involve the administration in any expense.

4.5 Amenities

A communal *canteen* is a feature on many estates. The premises are provided by the estate administration and the catering by a contractor. There is no need to provide *shops* on an industrial estate; very few, if any, estates have them.

A *crèche* is necessary if a large number of women with small children are employed. A *children's playground* should not be built within an industrial estate. The place for it is in the housing area, if any, near the estate.

A *bus terminal* in the usual sense of the term is not necessary. All that may be required is a paved area for four or five buses in a position that does not obstruct estate traffic. Whether even that is necessary depends on the public transport arrangements. If a service passes the entrance to the estate, the matter can be left to the transport authority.

A *meeting hall* may be desirable, but it is hardly a necessity. It is usually possible to use the canteen for the new meetings that need to be held. It is unnecessary on a small estate.

A few estates have *technical libraries*. Probably their most important function is to make available trade journals. Even if a formal library is not envisaged, space should be reserved in the administration building for the filing, display and perusal of technical periodicals.

The most important amenity that can be provided by an estate administration is *workers' housing*. Unless an estate is within six or seven kilometres of an urban or dormitory area, it may be necessary to build accommodation for the labour force. If a housing scheme for estate workers is envisaged, it is not sufficient to provide only dwellings. Stores, schools, recreational and religious facilities are also required. It is important that the accommodation be within the price range that workers can afford, and that if the premises are not let, there should be hire-purchase arrangements. Above all, the housing must be reserved for estate workers.

4.6 Financing the project

To implement an industrial estate programme, or even to construct a single estate, involves a large investment. The funds raised, or allocated, for the establishment of an industrial estate have to meet the costs of physically creating the estate and of providing and maintaining the various services; the latter, at least, until such time as they become self-financing. There are thus capital and recurring expenditures.

Capital, whether supplied by the government or raised by the sponsors of a private organization, is used to acquire and improve the site and to install the utilities - roads, water, electric power and drainage. In exceptional circumstances it may go so far as to cover the cost of buildings and services. Usually, however, funds are borrowed on the security of the improved land for the items mentioned in the preceding sentence.

Working capital is used to meet all the charges incurred in the running of the estate - salaries, street lighting, taxes, conservancy, maintenance and operation of services. In general, all of these will be recouped, with the possible exception of services of a promotional character, by the inclusion of a component in the rent of the structure to cover them, but they may not be recovered in full in a partially occupied estate. If it is necessary to increase the working capital, funds are usually borrowed from a commercial bank.

The different types of estates from the point of view of financial sponsorship - government, government-assisted and private estates - will be discussed below. Sponsorship by bilateral or multilateral aid organizations, which was quite common until the 1980s, has become unusual. As indicated in Chapter 2, international donors nowadays tend to concentrate on advisory services and financial support to general infrastructural improvements.

GOVERNMENT ESTATES

For government estates the executing agency may be either a government department, a parastatal government corporation or a municipality.

When a government department is the executing agency, all funds for the establishment of an estate comes from government sources, or through the government if foreign aid is involved. In a developing country this may be the only means of starting an industrial estate programme. Until the beneficial effects of an estate are demonstrated, there may be no other way to raise the required capital. The disadvantage of a department as an executing agency lies in the lack of persons with suitable commercial or managerial experience for executing the programme and managing the estates, and in the fact that, until the estate is able to meet its recurring costs, annual deficits must be met by the government. A parastatal (see Chapter 3) differs from a government department in that frequently there are non-government representatives on the board of directors, and it has borrowing powers. In countries with a federal constitution the central government usually makes long-term loans to state or provincial governments to construct industrial estates.

While municipalities frequently function as executing agencies in developed market economies, they are still comparatively rare in economies in transition and developing countries. In most cases, local government lacked sufficient decision-making powers to initiate such projects and the skills to execute them, at least until recently. Finally, the municipality by itself will in many cases not have access to adequate sources of finance.

GOVERNMENT-ASSISTED ESTATES

The principal difference between a government-assisted and private estate is that the former is eligible for government grants and foreign investment. Both may be in receipt of loans from the government, but, normally, loans to assisted estates are at concessionary rates and for longer terms. Often, government-assisted estates are the result of pressure on local entrepreneurs by the municipality to move from the urban centre, as in Turkey (see Box 1). The industrialists or the municipality, sometimes jointly, form a body to implement the project. This executing agency is usually organized as a co-operative society if it is composed entirely of entrepreneurs and is a *de facto* co-operative. A government loan is then approved for the sole purpose of erecting work-

places and buildings to house common facilities. The loan may not be used to purchase equipment.

PRIVATE ESTATES

Although private estates have become common, information on the financing modes of these estates is hard to find. Private sponsorship is likely to ensure that an estate is efficient and profitable. However, the necessity to provide a return to the private shareholders may defeat one of the broader, long-term objectives of development policy in many countries: that of stimulating small-scale enterprise by providing work-places at subeconomic rents, often in locations outside economic core regions. Co-operative estates can be a solution to this dilemma.

A variant on the private estate is the estate created by the erection of workshops by a privately-owned firm on surplus land within the compound of the factory. These work-places are let to small-scale entrepreneurs which will often be ancillaries to the estate owner.

5. PLANNING AND CONSTRUCTION

5.1 Main construction determinants

The development costs and the construction of an industrial estate are heavily influenced by:

- (i) The size of the site;
- (ii) The shape of the site;
- (iii) Its load-bearing capacity; and
- (iv) the location of the site in relation to physical services.

Another very important consideration is the potential demand for space over time, together with details of the type of demand: the type of industry which may be expected, the plot sizes likely to be demanded, the standard of design and layout, factory density, and an estimate of the required support facilities. Are investors likely to seek pre-built factory buildings or plots on which they can build their own? Should the estate cater for different types of industry? Demand for water, sewerage, electricity and telecommunications varies considerably with activities, and some estimate of the need for these services is required for the physical planning process.

Proper phasing of development in line with demand is a very important consideration in an industrial estate programme. The first development phase should preferably be completed in three or four years and be based on conservative demand projections. Often, it will be enough to develop five to 10 ha. of the site for the first phase. Changing economic conditions may require that the estate be expanded beyond the site originally reserved for development. Holding extra land in reserve is one solution, but will involve additional expenditure unless the land can be used for agricultural purposes. A new estate may therefore have to be built.

5.2 Size of the site

In some developing countries, such as India, integrated residential-industrial complexes have been constructed which cover hundreds of hectares. Elsewhere, as in Turkey and Peru, estates are found which accommodate hundreds of small enterprises. These are, however, exceptions resulting from great pressure on a large number of small firms to find new locations. Large sites can create congestion and transportation problems, and may be an obstacle to decentralized development, if this is a policy priority. Smaller sites can be disproportionately expensive to develop, although there are some very successful public and private sector estates on Mauritius with a land surface of less than 10 ha. This is in part related to the presence of comparatively high value-added activities requiring limited amounts of space. Most estate sites are in the 40 to 80 ha. range. There are significant economies of scale to be gained on sites up to 50 ha., as Table 5.1 shows.

5.3 Site specifications

The ideal site for an industrial estate for light and medium industry should have:

- ◆ A gentle slope for drainage (ideally less than 1:15);
- ◆ Good ground bearing conditions for foundations;
- ◆ Good access by main road to the city, port, and airport;

TABLE 5.1 SITE INFRASTRUCTURE COST (US\$, 1995)

	10 ha.	25 ha.	50 ha.
Roads, services	550,000	800,000	1,400,000
Treatment plant	450,000	450,000	700,000
Miscellaneous	100,000	150,000	200,000
Total	1,100,000	1,400,000	2,300,000
Cost per ha.	110,000	56,000	46,000

Source:

Figures are based on a number of EPZ and industrial park feasibility studies.

- ◆ An adequate water supply. About 40 thousand litres per hectare per day would be close to the minimum. With larger supplies, e.g. 60 to 80 thousand litres per hectare per day, a wider range of industries can be accommodated;
- ◆ Reliable electricity supply and telecommunications facilities;
- ◆ Adequate storm water drains at or close by the site;
- ◆ Facilities for treating industrial effluent and a means of disposing of the effluent after treatment. A satisfactory method of disposing of dry waste is also needed.

5.4 Site design and layout

Industrial sites should be designed and laid out to suit the requirements of industry. Estate industries differ among countries and regions, and each industry has particular design and layout requirements. The type of industry likely to be attracted to a certain estate is therefore an important factor in determining design and layout.

As a general rule, about one-third of the site is devoted to public areas including roads, administration buildings and green areas. The remaining two-thirds are available for industrial buildings. Normally about half the site is built over, thus one-third of the estate when fully developed is covered with commercial or industrial buildings. If the estate is designed for terraced buildings rather than industrial plots, a higher percentage (up to 45 per cent) may be covered over with buildings. If a site is badly shaped (e.g. long and narrow), roads and green areas may occupy more than one third.

If the potential investors are what might be termed "prestige investors", such as transnational electronics or medical equipment manufacturers, a low-density layout with very high standards of landscaping and appearance may be necessary. The total built-over area would then be at most 25 per cent of the estate. For small manufacturers who are very cost conscious, a higher-density building design, possibly using terraced factories or even simple sheds, would be more suitable.

5.5 Roadways

Roadways must be designed in outline at the preliminary stage, as their widths will determine the site layout and, together with their carrying capacity, the costs. Obviously, the roads should be

adequate for the estimated traffic flow and provide against congestion between the main road and any point in the estate where goods or personnel will be loaded and unloaded. At the same time they should not occupy more than about 15 per cent of the total area. Road design should allow for the installation and easy maintenance of the utilities (see below). Roads should not be congested by vehicle loading, unloading or parking. Such activities should be either completely separated from the roadway or in separate docks with limited access to the traffic-carrying roads.

During the first phase of development some roadways may be paved only in part. It is necessary, however, to allow sufficient width from the beginning, with utilities so sited that they will not be covered by road widening. These considerations generally indicate a rectangular road pattern, if the shape of the site and natural drainage (which is desirable) allow this. Cul-de-sacs restrict movement and are undesirable where communications between factories and access to central services are important, but they may be necessary to open up isolated sites and have the advantage of eliminating through traffic and reducing road and utility costs.

5.6 Common services and utilities

The extent to which common services, as described in Chapter 4, should be supplied by the developer will depend on the purpose of the estate and the availability and quality of services from commercial firms, municipal authorities and the government.

In the ideal situation, the estate is planned in relation to the development of a wider area. If a proportionate share of the cost of utilities is carried by those responsible for that development, then utilities can be made available very economically in the estate. An estate can not be commercially viable if it must shoulder large off-site infrastructure costs; nor should it provide free or subsidized infrastructural services to neighbours in need. In many cases the most practical solution for estate developers is to locate the estate close to existing utilities. If water and sewerage mains, electric power cables, gas and steam supply pipes are provided, these should run alongside roads, preferably under grass or hard, unmade ground for easy maintenance.

WATER

As stated earlier, the water requirements for dry industry are in the order of 40,000 litres per hectare daily. Where dye houses are proposed, 500,000 litres per hectare per day may be required. A storage tank with up to two days' water supply may be needed to cater for interruptions and breakdowns in water supply. Water is normally piped to each plot or site. Investors may be advised or obliged to provide on-site storage for a minimum of one day's supply to ensure continuity in case of supply interruptions. The water storage system does not have to be located on the estate.

Where economically feasible, a ring system of mains should be used to reduce the danger of supply interruptions; enable sections of mains to be shut off for maintenance; and prevent pressure drops when users at different positions on the line are drawing water at the same time.

POWER

It costs more to bury power cables than to run them on overhead poles, but this may be justified by the estate's improved appearance, safety and security (overhead cables may be stolen). As a general guideline, about 1 megawatt per 10 hectares of site area should be available. Small industry estates may require less. Power supply companies often guarantee an uninterrupted supply, or at least high priority for estate users. This is an important attraction for investors.

Normally the individual client/investor will deal directly with the company supplying the electricity. Occasionally, the estate developer may generate his own electricity, or take on the responsibility for supplying electricity to individual investors.

SEWAGE AND DRY WASTE DISPOSAL

Pumphouses and treatment plants should be planned to minimize pipe runs while avoiding nuisance and odours, and have a capacity equivalent to the water supply for the area. Usually the system will be designed to accept normal domestic sewerage. Trade effluents which do not conform to acceptable standards must be treated by the factory before entering the system.

A biological oxygen demand (BOD) reduction plant with aeration and sedimentation followed by sludge drying in filter beds is adequate for most estates. It can be built in modules to suit demand. In designing the plant it is necessary to provide enough space for sludge-drying filter beds and some space for sludge storage. Where effluents with chemicals or metals are produced, these should be pre-treated at the investor's premises to a specified standard before discharge into the main sewer.

Dry waste must be stored safely (preferably in closed containers) and collected regularly. It is usually deposited in land fills. This is often unavoidable, but may lead to air pollution, formation of greenhouse gases and groundwater pollution. Alternatives (greater production efficiency, recycling of waste, composting of organic waste - also a source of biogas) should be encouraged.

While these represent essential steps for controlling pollution, an integrated approach to the estate's environmental sustainability is recommended. Box 7 gives some basic rules for this purpose⁵⁾.

5.7 Pre-built factories and multi-storey factories

Before planning begins it should be decided whether an estate should have pre-built, standard single or multi-storey factories. Public estates in Mauritius now restrict themselves to providing serviced plots, leaving the construction of factory space to the enterprises. Special loans are available for this purpose. Factory construction may however also be precluded or limited by cost considerations. Where an estate targets small industries, the emphasis should be on simple workshops, preferably built with low-cost local materials⁶⁾.

The arguments in favour of pre-built standard factories are that:

- (i) It has been demonstrated that a great variety of industrial operations, particularly free estate type operations, can be carried out efficiently in non-specialised buildings;
- (ii) They can be leased, saving the industrialist capital expenditure at the development stage, which makes great demands on his capital;
- (iii) They enable production to start quickly, which is often a requirement for a new industrial project;
- (iv) They avoid problems and effort for the industrialist in an area where he has limited experience: construction;

5) UNIDO's Environment and Energy Branch (ISED/ENV) can provide advice on environmentally friendly estate operations.

6) For advice on construction materials and methods, contact the Building Materials Unit of UNIDO's Chemical Industries Branch (ISED/CHEM).

BOX 7: THE ENVIRONMENTAL IMPACT OF ESTATES, AND THE BASICS OF ENVIRONMENTAL MANAGEMENT

Relatively little attention has been paid to the environmental impact of industrial estates in most developing countries. Moving industry out of town all too often merely means shifting pollution away from existing residential areas, and where action is undertaken, this rarely extends beyond end-of-pipe treatment. The Balaju estate near Kathmandu in Nepal is adjacent to a nature reserve. Some of the factories have their own pre-treatment plants and some have their waste removed, but there is no waste collection and effluent treatment system covering the whole estate. As specific standards are lacking, the regulations on pollution in the Industrial Enterprises Act cannot be enforced. Fortunately, most industries on the estate have a limited environmental impact and growing awareness of the environmental aspects of industrial activities has recently resulted in a pollution prevention study which should lead to more effective environmental measures.

While innovative approaches to environmental protection are still rare in developing countries, there are interesting exceptions. At a site in Wuxi, China, photoprocessing produces large quantities of silver-contaminated wastewater. The silver concentration is too low for the usual recovery methods. An artificial wetland was therefore constructed where water plants absorb the silver – root systems of water hyacinths are capable of concentrating silver up to 35,000 times the level found in the wastewater. After several treatments, the plants are collected and burned. Between 95 and 99 per cent of the silver is recovered. This system therefore saves both water resources and silver. This type of measure is of course limited to estates with a similar type of effluent, i.e. to single-industry estates. But the mindset which led to this solution will also find solutions for more complex problems.

Ecologically sensitive estate planning, construction and management will be based on environmental impact assessments of the estate project as such and of individual enterprises, and will:

- ◆ Maintain or restore parts of the original natural area where possible (this will also contribute to the site's attractiveness) and preserve natural drainage systems (these can double as flood control systems);
- ◆ Use environmentally sensitive construction methods and all locally viable methods to design energy-efficient sites (passive solar heating, tree shade instead of air conditioners);
- ◆ Arrange buildings as compactly as possible from a technical and economic point of view, to save on infrastructure and transport;
- ◆ Develop a transport management system for factory staff and goods;
- ◆ Establish a comprehensive system for wastewater treatment, solid waste management and prevention of air pollution;
- ◆ Use water resources as efficiently as possible (recycle wastewater where possible);
- ◆ Encourage environmentally sustainable production methods;
- ◆ Generally take a long-term approach to the ecological carrying capacity of a site.

- (v) By using prefab modules, they can be planned to facilitate expansion even when this is not foreseen by the industrialist;
- (vi) They can be used to improve working conditions and enhance the productivity of industry;
- (vii) They give the developer better control over the appearance, facilities and amenities in the estate;
- (viii) Rents can be adjusted according to the purpose of the estate, to encourage particular types of industrial development;
- (ix) In times of high inflation, buildings can prove a valuable investment.

The disadvantages of building factories in advance of demand is the large capital requirement and the risk for the developer.

Multi-storey factories are less efficient from a production viewpoint than single-storey buildings. They are only suitable for light industries like garments, electronics, etc. Besides, some estate developers have experienced considerable difficulty in leasing the upper stories. But in areas where land is expensive and scarce, cost considerations may dictate the use of such buildings.

5.8 Phasing of development

The costs of developing land (drainage, roads and utilities) is high. Therefore, development is normally carried out in stages related to the rate of growth. A successful industry operating in a pleasant environment and supplied with all the necessary utilities and services of a estate is good publicity. Therefore the first phase must be finished quickly and be reasonably complete in itself. The first phase should be restricted to an area which can be completely developed and occupied within two or three years. This means a realistic (or conservative) appraisal of the likely initial demand for space: 10-15 ha. is usually more than adequate. Many estate developers, particularly public sector developers, have overestimated the demand for space during the first phase. As a result, they were left with expensive unused capacity for many years, leading to financial difficulties, lack of money for maintenance, and a gradual, steady deterioration in the general infrastructure. In some cases, transformers and sewerage plants had such excess capacity that they were unusable. If demand exceeds expectations, the second phase of the development can always be accelerated.

6. ORGANIZATIONAL CONSIDERATIONS AND ADMINISTRATION

6.1 Selection of enterprises

For an estate built to relocate industry there is no need for an admission policy; all establishments involved in the move must be housed. If new enterprises are to be introduced into any estate, it becomes a matter of selecting from among the applicants those most suitable in the light of national industrial objectives. This involves the assignment of priorities. How far an admission policy is applied is open to question. On some estates it is obvious that the objective has been to fill the vacant plots as quickly as possible. However, the factors normally to be considered in connection with the applicant enterprise are:

- (a) Its complementarity with existing or prospective establishments in the estate;
- (b) Its level of technology;
- (c) The employment it will provide;
- (d) The use it will make of local materials.

The relative priority assigned to each of these will depend on the principal goal of the estate. An applicant enterprise that can provide services needed by establishments on the estate should be given a high priority. Its presence could obviate the necessity for the estate administration to supply such services. A high level of technology is to be encouraged provided it does not run counter to the goal of increasing employment. Preference should be given to entrepreneurs who are prepared to modernize their equipment. In a few instances this has been made a condition for admission.

If an establishment uses electricity or water at a rate per worker much greater than that allowed for in the design of the estate, the expansion of other establishments may be restricted. If a firm needs a great deal of space per worker, the employment potential of the estate is reduced. Industries in which there is a high risk of fire or explosion could cause damage to other properties on an estate. Industries handling toxic materials can affect the quality of output of food processing industries. Nuisance can be caused by the excessive emission of dust (e.g. stone crushing), smoke (e.g. brickworks) or offensive odours (e.g. tanneries). On a large estate it may be possible to accept such industries by assigning them to special zones, but that is not possible on a smaller estate.

6.2 Selection of entrepreneurs

The many objectives of an industrial estate can be summed up in the words "industrial expansion". To attain this, it is essential that the firms on the estate increase productivity and profitability. This will largely depend on the entrepreneurial acumen of their managers. Estates may, and do, shelter firms that neither contribute to the development objective of the enterprise nor to returns on sponsors' investment. Therefore, the entrepreneurial ability of the applicants must be ascertained. A good screening procedure will help to identify the right type of entrepreneur. To prevent speculation with freehold plots, entrepreneurs should only be accepted if their investment projects have been approved by the authorities and if they can submit proof that adequate financial resources have been secured. Speculators will be screened out in this way.

If the reason for the application is the transfer of an existing enterprise, then information on the credit-worthiness of the applicant may be obtainable from his bank, and on his business

reputation by discreet inquiries in the trade. It is more difficult if an applicant is proposing to engage in a new line of business. An effort should be made to ascertain what experience, if any, he has in that field. Lack of experience need not necessarily disqualify him if he is in a position to employ the necessary expertise. His ability as a manager may be gauged by the success of his current undertaking.

Applications may be received from persons without previous managerial, or even commercial experience. They may come from skilled tradesmen who wish to start up for themselves, often women, civil servants, ex-soldiers. In general, a skilled tradesman is likely to develop into a successful entrepreneur if he can raise the required capital to finance his proposed operation and if he realizes that he will need (and get) some assistance in its management. Retired civil servants and ex-soldiers often make excellent small-scale industrialists (the UNIDO project in Pakistan referred to in Box 6 targets ex-soldiers). They have the qualities of discipline and attention to detail that are necessary for the successful running of a business. In spite of a cultural bias against them, women often have these qualities in abundance as well. It is essential to establish that these groups have, or can obtain, the required technical experience and knowledge of marketing. Hence the importance of training programmes. Encouraging women entrepreneurs will, in addition, require the removal of discriminating legislation and practices⁷⁾.

6.3 Control of investor activities

Orderly development of an estate requires some controls on investor activities. Their main purpose is to ensure that investors behave as good neighbours, construct buildings which are in conformity with an overall plan for the estate, and use and maintain them in a proper way. The controls should also bind the developer to certain standards and policies. Investors (especially those which might be classed as high quality, like electronics or medical equipment manufacturers) will normally seek assurances that no unsuitable development will take place in or near the estate, e.g. activities involving odours, smoke or dust. Controls can take the form of conditions attached to a licence or lease agreement, or as a set of by-laws or protective covenants, and may include the following:

LIMITATION ON TYPES OF ACTIVITY

In many developing countries and economies in transition, environmental factors were often neglected when factories were established in the past. While everything should be done to reduce their environmental impact, it may not always be possible, for economic and social reasons, to curtail activities. The establishment of new polluting factories, however, should be discouraged. The short-term gain brought by accepting these plants is unlikely to outweigh the long-term cost to society and the environment. Industries requiring special safety precautions such as refineries and explosives manufacturing should be assigned to separate areas, or estates located well away from residential areas.

BUILDING RESTRICTIONS

Building plans should be subject to approval by the estate developer, in addition to any approvals from planning authorities or other agencies involved in building control. Normally, the

7) The Integration of Women in Industrial Development Unit of UNIDO's Human Resource Development Branch (HEPD/HRD/WOMEN) may be contacted for further information on this issue.

developer will have a set of guidelines indicating the height and design restrictions, the building line (x metres back from the centre of the road or the edge of the plot), and the built-over or building/open space ratio in each plot. In many estates the ratio is 50, i.e. the building area can occupy half the plot area. In some higher quality estates the building/open space ratio may be as low as 30:70. If the estate is close to an airport there may be also restrictions on lighting and advertising signs. Plots and buildings must be completed/occupied within an agreed period. Without authorization no changes in the purpose of a building, subletting or alterations to buildings may take place.

PARKING

All well-planned estates have parking restrictions. Each investor may be obliged to provide enough parking space for cars and trucks on the site to avoid parking on roadways. Truck parking in front of buildings may be prohibited.

STORAGE

The developer will often set down standards or guidelines for the storage of chemicals and/or hazardous goods. The developer may reserve the right to improve the storage of such goods.

SAFETY

Each building should conform to fire regulations and industrial safety standards.

POLLUTION

Domestic sewage can usually be discharged into the sewer system. Industrial liquid effluent is normally treated at the plant prior to discharge. The estate developer or environmental authority should approve the proposals for treatment of industrial waste and the equipment to measure the volume of the discharge. They may find it necessary to limit the volume of the discharge from time to time and to vary the discharge standards to comply with new environmental regulations.

Substances which would damage the sewerage system would be prohibited. These include: any liquids at a temperature exceeding 45 degrees centigrade; substances such as adhesives or paint which form viscous or solid coatings on the system; petroleum or other inflammable spirits; radio-active substances; effluents with high levels of acidity or alkalinity (i.e. with a pH value below 6 or above 9); and substances which produce fumes or odours. No effluent or harmful material should be allowed to enter storm water drains.

Solid waste must be stored safely (if possible in closed containers) until it is removed. Air pollution must be kept below the standards set by the estate by using effective combustion processes and/or installing scrubbers or filters.

The estate developer and/or the environmental agency should monitor the adherence of each plant to environmental regulations on a regular (monthly) basis. This means that the developer or environmental officer would have the right to enter premises at all reasonable times to take samples and do all that is necessary to ensure that environmental standards are maintained.

6.4 Basic services

The common services, common production facilities and amenities that may be found on industrial estates were listed in Chapter 4. Some must be available from the moment the estate is ready to receive tenants. The others may wait until it is seen how the situation develops. In the first group are:

Common services:	Fire protection
	Waste treatment and collection
	Security

Amenities:	Canteen
	Workers' housing

The sponsors will need to provide workers' housing only if accommodation is not available within commuting distance, and if the local authority is unable to build a housing scheme near the estate.

6.5 Administration

The size and duties of the administration will depend on the services to be provided. The administration may have three divisions - managerial, technical and financial. Box 8 gives an overview of their respective duties.

On all estates, irrespective of size, there must be arrangements for carrying out the duties of the managerial division. In some countries, the estates are administered by a resident manager or superintendent, an officer of the sponsoring organization. Whichever system is adopted, it is advisable that one organization be responsible for all managerial functions.

SIZE OF ESTATE ADMINISTRATIVE STAFF

The cost of administering an estate must be borne by the tenants, by the sponsors or jointly. Normally it should fall on the tenants; otherwise they receive, in effect, a continuing subsidy. It is essential, therefore, that the cost of administration be kept as low as possible, consistent with the maintenance of the services needed. The largest single component of the cost usually consists of salaries.

It is sometimes argued that the administration should be carried out by an association of entrepreneurs occupying premises on the estate. So far as is known, the only instances of occupier administration occur in cooperative estates (private and government-assisted). It is, however, desirable for an association of tenants and/or owners to cooperate in the administration.

TECHNICAL AND FINANCIAL FUNCTIONS

An estate administration does not always carry out all functions that are technical and financial. Certainly, in the absence of any other organization, the operation of central workshops, common service facilities and plant-hire schemes would come under its aegis, if they are provided at all. All the duties listed can be carried out more conveniently by a separate organization - an extension service, small industries institute or the like - catering to the whole small-scale industrial sector. As indicated before, common technical services are probably best managed by a private-sector entity.

BOX 8: FUNCTIONS OF THE ADMINISTRATIVE DIVISIONS

Managerial division

The duties of the division are:

- (a) To implement the admission policies of the sponsors;
- (b) To enforce the restrictive covenants in lease agreements;
- (c) To maintain the buildings and services on the estate;
- (d) To arrange the payment of taxes and all charges that may be levied on the estate, and the wages of estate employees;
- (e) To collect rents and other dues from tenants;
- (f) To be responsible for the general good order of the estate.

Technical division

This division of the administration is responsible for the common facilities, technical and training services that are provided:

- (a) Operation of the central workshop and other common facilities;
- (b) Operation of plant hire scheme;
- (c) Preparation of feasibility studies and project reports for tenant enterprises;
- (d) Provision of marketing information;
- (e) Organization of training schemes;
- (f) Organization of exhibitions.

Financial division

The functions of the division are:

- (a) Either to provide direct loans to estate tenants or to guarantee loans extended to tenants by commercial banks;
- (b) To arrange bulk purchasing of materials;
- (c) To allocate scarce materials to estate enterprises.

It is not the duty of an estate administration to interfere in the running of individual enterprises on an estate. The manager of a small estate may be called upon to advise tenant entrepreneurs on almost any aspect of their business. The manager should be in a position to do so. He should not be expected to provide all advice on the basis of his own experience, but he should be able to put a client in touch with the person or organization that can supply it.

DUES OTHER THAN RENT

Apart from rent, enterprises pay dues for water, electricity, medical services and, sometimes, conservancy. A perennial question is whether the estate should buy electricity in bulk for distribution to the tenants or whether the supply company should provide the service directly. There can be a considerable saving to the tenants if the estate undertakes the distribution. However, the estate may be faced with the cost of providing the necessary appliances, along with reading the meters, preparing the bills and collecting the amounts due. The system can be of great help to small consumers. The matter should be decided on an actuarial basis allowing for the extra costs involved to be borne by the estate administration.

7. EXTERNAL SUPPORT INSTITUTIONS

7.1 The need for effective external support

An industrial estate is only one element in an industrial promotion programme. Its enterprises need qualified managers, a trained labour force and sources of technical advice and finance. An estate can be the means of delivering them, but only if it is supported by the appropriate institutions. These will normally cater for other enterprises in the area as well. In economies in transition and developing countries, the institutional support infrastructure is usually inadequate, although countries in the former group tend to have a good system of general technical education.

In the absence of privately-run support services, which are the norm in developed market economies, such services can be set up by the government, non-governmental organizations or associations of private enterprises; increasingly, the latter two are taking on this role. In many countries, such services receive financial support and technical advice from bilateral and multilateral agencies. UNIDO has extensive experience in setting up SME support systems and technical/managerial training programmes⁸⁾. In addition to training, technical consultancy and financial services, countries often have an integrated industrial extension service to guide, advise and support small-scale entrepreneurs through the initial steps in establishing their businesses, and to lead them towards effective self-reliant management, high quality, low cost production and self-sustained growth.

Where market forces do not (or cannot) provide a "natural selection" of such services on the basis of effective demand, there is the danger of a wide gap between the need for and the supply of services. There are numerous examples of support agencies whose mandates overlap or whose activities target the wrong groups, resulting in confusion among clients and wasted resources. In Malaysia, for example, 30 government agencies offered assistance to SMEs until a radical reorganization of support services took place in 1996. Lack of developmental efficiency is one reason for the increasing emphasis (also among donor agencies) on involving the private sector in the provision of support services. Another reason is that staff of public-sector support agencies, unless recruited from the private sector, will not really understand the problems of enterprises or have the expertise to solve them.

Support agencies must be close to their clients, also in a geographic sense. In the case of public sector agencies, this implies delegation to lower administrative levels. Local capacities must be strengthened accordingly. To use limited human and financial resources effectively, support should focus on areas where a sufficient number of (potential) clients are found, and on the most promising activities. It is now generally agreed that services should at least be partly funded by charging fees. This will reduce demands on government budgets and will increase cost-consciousness among clients.

7.2 Financial institutions

For the purpose of providing long-term credit, many countries have established development banks. Subsidized interest and credit guarantee schemes are often available to stimulate investment in manufacturing. A fairly common experience in developing countries is that access to credit is difficult for women, although women's loan repayment rates tend to be higher. Targeting women entrepreneurs in credit programmes may therefore be doubly justified.

No matter what type of institution is formed or selected to finance small-scale industry it is essential that it be suitably staffed to evaluate technically and commercially the projects put

8) For information, contact HEPD/SMI and HEPD/HRD or HEPD/HRD/WOMEN in UNIDO.

before it, or that it be able to draw on the services of some other organization for this purpose. The experience with financial schemes which particularly target the small-scale sector has been mixed. Inadequate customer orientation (complex procedures, unhelpful staff) is an often-quoted problem. Revolving schemes suffer from low repayment rates. With regard to the latter, loan schemes relying on "peer pressure" have performed better. The "Jua Kali" community-based loans programme for rural micro-entrepreneurs in Kenya, for example, benefits far more people, especially women, and appears to be more cost effective than that country's more traditional Rural Industrial Development Centres and Industrial Promotion Areas. However, it does not provide hard infrastructure, and "graduation" to modern small scale industry - which makes much greater demands on location and serviced sites - does not appear to take place.

While special financial facilities and programmes can and do contribute to industrial development, they can only help a minority of enterprises. The crucial question therefore is how conditions can be created which will stimulate the development of private banking, and how competition among banks can be increased to lower the cost of credit.

7.3 Training

Most countries have a vocational training system. It may take the form of a trade school for those who have left school, or a special school within the normal educational system. The success of either of the above methods depends on how well the school is equipped and how near it reproduces working conditions in industry. Few of the developing countries have a formal apprenticeship system for on-the-job learning. A combination of vocational training with a formal apprenticeship is usually best. One of the problems in providing training courses for persons in employment is that few employers are prepared to continue paying the trainees' wages; hence the need for stipends.

Lack of modern managerial skills is pronounced in the small-scale sector; in the economies in transition, they are also lacking in large-scale enterprises. The quality of such management training that is available in these countries often leaves much to be desired. In large enterprises, a joint-venture agreement with a firm from a developed market economy can be of great help in transferring modern management skills. For small enterprises, this option is rarely available. Some foreign assistance projects of European countries have successfully employed retired managers for this purpose.

Little information is available on the training of supervisors. That there is a need to improve the standards of supervision in industry is widely recognized. There are, however, two aspects to this problem: upgrading of technical skills and maintenance of good personal relationships. The latter generally comes under the heading of management techniques. While the most highly skilled worker does not necessarily make the best foreman, it is true that one of indifferent skill never can possess the necessary authority to be a satisfactory supervisor.

7.4 Extension services

An extension service is essentially a multidisciplinary organization created to solve the technical, managerial and financial problems of small-scale enterprises through advice, diagnostic services and direct support. The extent and content of an extension service depends on the predominant type(s) of industry, the levels of technology and entrepreneurship of the small-scale industrial sector, and the number and density of enterprises.

The necessity for links between purely technical counseling and managerial advice is evident. What may not be so obvious is the linkage of extension services and sources of finance. It is pointless to make a recommendation to an entrepreneur unless, at the same time, he can be

provided with information on how to obtain the funds to follow it up. Nor can the availability of finance be effective if the borrower lacks the knowledge or the ability to make the best use of the proceeds of the loan. With regard to technical advice, experience in a number of countries (among others the Republic of Korea) has shown that small enterprises rely more often on their business partners than on extension services. Where such services are used, there is a preference for private-sector agencies.

The provision of services to clusters of related small enterprises in a particular area may be cheaper and more effective. It is also likely to intensify linkages among them, accelerating their development. A UNIDO project in Honduras starts with the latter. Once firms have understood the advantages of finding common solutions to common problems, clusters are assisted in identifying and analysing their specific problems, determining common development objectives and generating a joint project to attain them. Experts then help to upgrade the capabilities of the clustered enterprises. The clusters are also assisted in building links with institutions such as banks and research centres, and lobbying for the improvement of policies and regulations affecting small enterprises with the relevant authorities.

In several developing countries in Asia, highly effective subcontractor development programmes are undertaken by Japanese firms. These are comprehensive programmes with activities ranging from financial support to staff and management training. The aim - raising productivity, innovativeness and product quality - is basically the same as that of extension services. The disadvantage, of course, is that these programmes are restricted to subcontractors. Ancillarization policies in India, which tried to achieve the same "by law", have not been a great success because it was usually not in the direct interest of the large firms to assist their small suppliers.

7.5 Regional and local development agencies

Regional/local development agencies can deliver, coordinate or facilitate access to services. This depends on their mandate, which again depends on the issues they are expected to deal with at the local/regional level. As development tools, regional/local development agencies are not suitable for all countries or regions. A minimum "critical mass" of local industrial potential must be present if the agency's activities are to make a developmental impact, and there must be sufficient scope and resources for independent decision-making at the regional or local level. Regional development agencies are usually mixed public-private institutions and are strongly oriented towards the private sector, in the setting of an overall development strategy which should preferably be the outcome of public-private sector consultations⁹⁾.

In Romania, UNIDO has helped the government to set up a Centre for the Promotion and Development of Small and Medium Enterprises. This is not a traditional SME support agency, as its actual work is done by a network of autonomous Business Development Centres throughout the country which provide advisory and information services as well as assistance with loan applications. They also provide feedback to policy makers on bottlenecks and opportunities in private sector development.

9) These agencies are discussed in UNIDO "Regional Industrial Development Agencies", 1997

8. A BRIEF EVALUATION

8.1 The effect of estates on industrial and regional/local development

The available empirical material allows the following broad conclusions to be drawn on the impact of industrial estates on industrial, urban and regional development plans:

- (a) In most countries only a small proportion of the industrial enterprises and of the labour force operate in industrial estates, and consequently any improvements effected by estates are *per se* limited;
- (b) For industrial estates to make a significant contribution to industrial development they must be supported by financial, training and incentive policies;
- (c) Industrial estates can play an essential part in urban and regional development, provided the estates are successful in other aspects, and can be of great help in reducing the environmental impact of industry;
- (d) Industrial estates can be very effective in providing accommodation for relocated establishments;
- (e) Industrial estates have had limited success in attracting industry to semi-urban and rural areas;
- (f) Industrial estates can help industrial entrepreneurs to make considerable savings on financial resources, but estates do not by themselves result in more efficient use of capital and labour.

These observations deal only with the results achieved by the use of estates as policy instruments. An estate, like any other form of industrial concentration, will also have internal and side effects.

8.2 Internal effects and spin-offs

INTRA-ESTATE TRADING

Purely ancillary estates have no internal trading, as all their outputs are intended for the parent firm. There is no significant trading between firms on estates containing only heterogeneous industries. Cooperative estates seem to do better. The result may be attributed to the spirit of co-operation that developed between society members as they worked to create the estate. All in all, however, evidence of linkages between firms on estates is quite limited. In a number of cases where this happened, trade between firms would have developed independently of their location.

SOCIAL/HEALTH ASPECTS

In general the health and safety aspects of working conditions are superior to those outside. Conditions are healthier because of better ventilation and lighting and the provision of sanitary and ablutionary facilities on a scale related to the numbers employed. Safety is greater, perhaps because it is easier for factory inspectors to enforce regulations on the guarding of dangerous machinery within the confines of an estate than it would be among the same number of enterprises scattered throughout a large town.

In countries with minimum wage legislation it is unusual to find estate workers, especially those in small enterprises located in provincial towns, who do not receive their legal entitlement. The

repeated contacts between workers in various establishments ensure that all are aware of their rights. The repeated contacts may lead to stronger trade unionism, but evidence on this issue is very limited.

SPIN-OFFS

There is little evidence of external spin-offs, in terms of new manufacturing firms, which are the direct result of the location of an industrial estate. It is not uncommon to find food stalls and barber-shops, often in makeshift premises, at the entrance to an estate. Sometimes, a private company obtains a franchise to operate buses between an estate and the area of a workers' dormitory.

8.3 THE MOST COMMON REASONS FOR FAILURE

The extent to which industrial estates have contributed to the realization of development programmes has sometimes fallen short of expectations. The reason may be one or more of the following:

- (a) The unrealistic nature of the objectives of the programme;
- (b) The absence of co-ordination with other development programmes;
- (c) The inadequacy of supporting institutions;
- (d) The lack of adequate pre-planning;
- (e) The vacillating attitudes of the government towards the programme.

All these are important but the first and the last are paramount. It is obvious that unrealistic objectives, by definition, cannot be realized, and if a programme is hesitatingly pursued it can never be more than partially effective.

UNREALISTIC OBJECTIVES

A government may be quite clear on what it wants to achieve, but it may not appreciate that there are certain preconditions to be satisfied before achievement is possible. This may apply at both the national and regional level. A common objective of industrial development programmes in the least developed countries is to increase indigenous participation in industry. The establishment of an industrial estate will not have this result if indigenous industrial entrepreneurship is lacking.

In many of the least developed countries and in some countries with economies in transition, the per capita income is so low that there is no margin to permit the purchase of the products of new industries. Indeed, sections of the population may be outside the monetary economy. In such circumstances it is unrealistic to establish an industrial estate in the hope of attracting new ventures, unless some new resource can be exploited.

If an estate is to contribute to the industrial objectives of the government, it must provide the facilities industrialists need. If it fails to supply the latter, it certainly would be unrealistic to expect it to achieve the former. Estates have been established where there has been little need for them.

ABSENCE OF CO-ORDINATION WITH OTHER DEVELOPMENT PROGRAMMES

Estates have been built in locations where communication systems and the supply of electricity or water are inadequate. Without an infrastructure programme for the area or the country as a whole, an estate cannot function. Rural estates may fail because the agricultural sector does not produce enough of a surplus to supply food processing industries.

INADEQUACY OF SUPPORTING INSTITUTIONS

All industry needs access to finance. The need is greater for small-scale industrialists since they seldom have the reserves of their larger counterparts and are unable to provide the collateral required by commercial banks. In any case the commercial banks are rarely interested in long-term lending, which is the kind of credit needed in the small-scale sector for expansion, and short-term funds are available only at interest rates that reflect the risk the bank considers inherent in small-scale ventures.

Small-scale entrepreneurs need advice on the selection of materials, machinery operating methods, diversification of production, quality control; in short, to a greater or lesser extent, on all aspects of production and managerial techniques. If the stimulation of the small-scale sector is an objective of the industrial development programme, as it is in many countries, then the means should be available to make good the deficiencies. An industrial estate can have only a marginal effect on development if it is not supported in this fashion.

LACK OF ADEQUATE PRE-PLANNING

Estates that have failed to fulfil expectations mainly are those for which a pre-project survey was not or inadequately carried out, resulting in the selection of an unsuitable location. Some estates have been sited in rural areas where little or no industry exists, and consequently have been slow to develop. The location of some has been the result of political pressure, and many of these have failed to develop.

VACILLATING POLICIES

For an industrial development programme to be successful it must be vigorously pursued. While estate authority and management should respond to changing circumstances, the objectives of an estate programme and of individual estates must be pursued consistently over the years.

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